

THE CAPABILITY OF GPR FOR UNDERWATER  
ARCHAEOLOGY

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## **AUTHOR'S DECLARATION**

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

Ground penetrating radar (GPR) is a method that uses radar pulses to image the subsurface. Underwater archaeology, on the other hand, is the practice of conducting archaeology underwater, encompassing historical and industrial eras. Currently, seismic measurements are used in underwater archaeology. However, there are two problems associated with using seismic measurements for this purpose. Firstly, extremely shallow water columns may be affected by multiples or attenuated by a gassy subsurface. Secondly, the GPR is more capable of resolving the various material contrasts of submerged archaeological structures compared to seismic methods. The aim of this study is to assess the suitability of GPR for underwater archaeology. The objectives are to evaluate the different frequencies and their suitable ranges and to analyze GPR profiles for underwater sites. To achieve this, simulations were performed using two frequencies which is 250MHz and 800MHz. A metal object representing an archaeological item was submerged, and two types of water which is freshwater and contaminated water were tested to determine the suitable frequency for each. Finally, all the data were processed using ReflexW software before analysis and conclusions were made. The results of this study depend on the radargrams and hyperbolic image obtained from the software. Therefore, the findings of this research will benefit individuals involved in the fields of archaeology and geomatics. This is particularly important as there are currently no practical studies on the use of GPR for underwater sites.

## TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	CONFIRMATION BY PANEL OF EXAMINER	II
	AUTHOR'S DECLARATION	III
	SUPERVISOR'S DECLARATION	IV
	ABSTRACT	V
	ACKNOWLEDGEMENT	VI
	TABLE OF CONTENT	VII
	LIST OF FIGURES	IX
	LIST OF TABLES	XI
<b>1</b>	<b>INTRODUCTION</b>	
	1.0 Introduction	1
	1.1 Background Of Study	1
	1.2 Problem Statement	2
	1.3 Research Questions	3
	1.4 Aim and Objectives	3
	1.5 Scope and Limitation Of Study	4
	1.6 Significance Study	4
	1.7 Chapter Outline	5
<b>2</b>	<b>LITERATURE REVIEW</b>	
	2.0 Introduction	6
	2.1 GPR Measurements Concept	6
	2.2 Frequency Of GPR	8
	2.3 GPR for Archaeology Underwater	9
	2.4 Electrical Conductivity And Temperature	10
	2.5 Dielectric Permittivity	11
	2.6 Level of Water Clarity	13